Zoom-in Hydrodynamics Simulations of Binary Mass Transfer
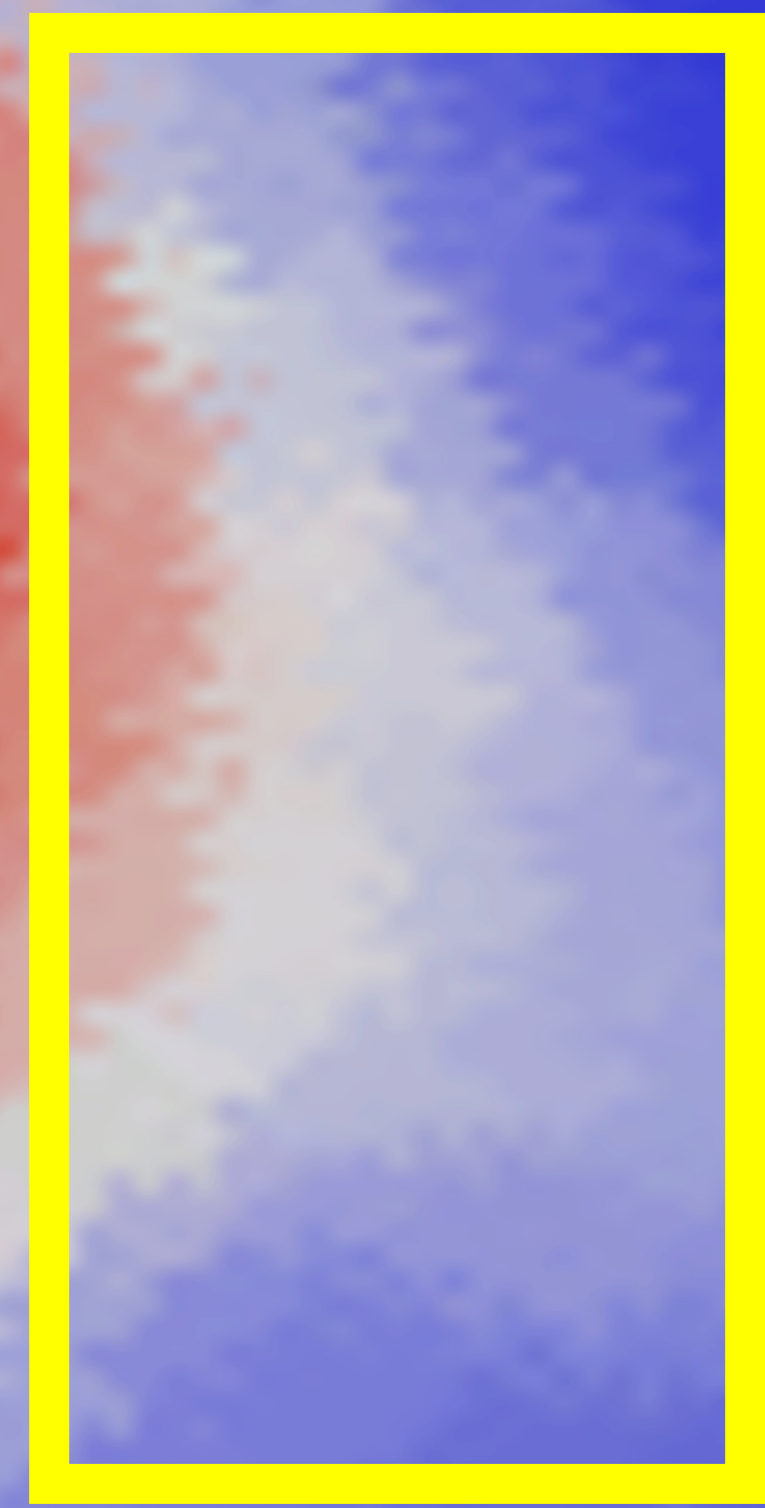
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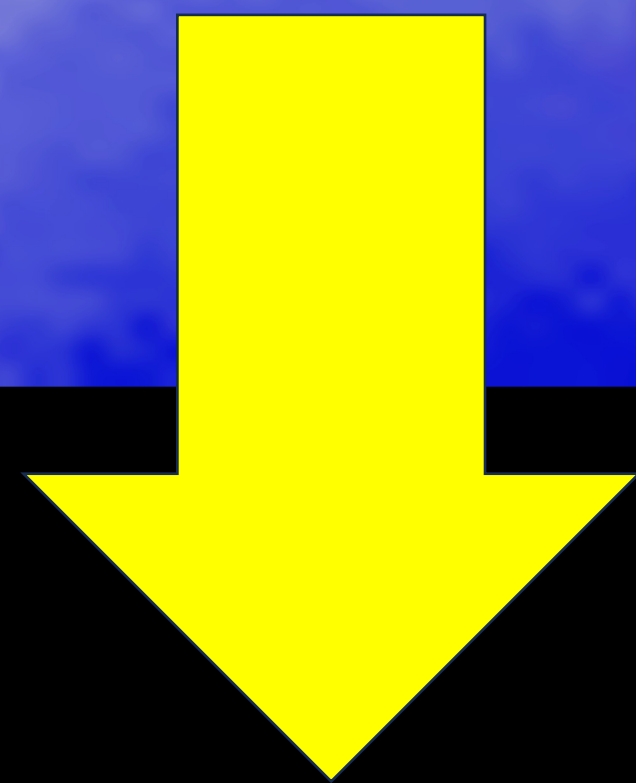|	
Why mass transfer?	Inevitable evolutionary phase of close binary systems
Current status	Mostly relying on analytic models, not properly capturing multi-D non-linear effects
Challenges	Computationally expensive to resolve the entire stellar surface in 3D
Solution	Zoom-in near Lagrangian points

Athena++ with Initial profile: $P = K\rho^\gamma$ and equation of state (EOS): $P = (\Gamma - 1)U$

Nondimensionalizing (overfilling factor as a scaling factor)

For the L1 point of equal-mass binaries

1. Stream morphology

Origin of main streams?

?

2. Mass transfer rate comparison

Analytic solutions are accurate?

?

If you want to know more and watch some movies for simulations, please come to Poster 22 with the mass transfer image